

US EPA ARCHIVE DOCUMENT

Using GPS and GIS for Hawaii Inland Area Planning



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Tetra Tech



Background

- The Clean Water Act, Section 311(j)(4), as amended by the Oil Pollution Act of 1990 (OPA) Section 4202(b), requires that area contingency plans be developed for specified areas designated by the President.
- These Area Contingency Plans are to be developed by an Area Committee that is made up of technically qualified individuals from federal, state, and local governmental agencies. Under Executive Order 12777, the President delegated the authority to designate Areas and Area Committees to the Secretary of Transportation (U.S. Coast Guard) for the coastal zones, and the Administrator of the U.S. Environmental Protection Agency (EPA) for the inland zone.



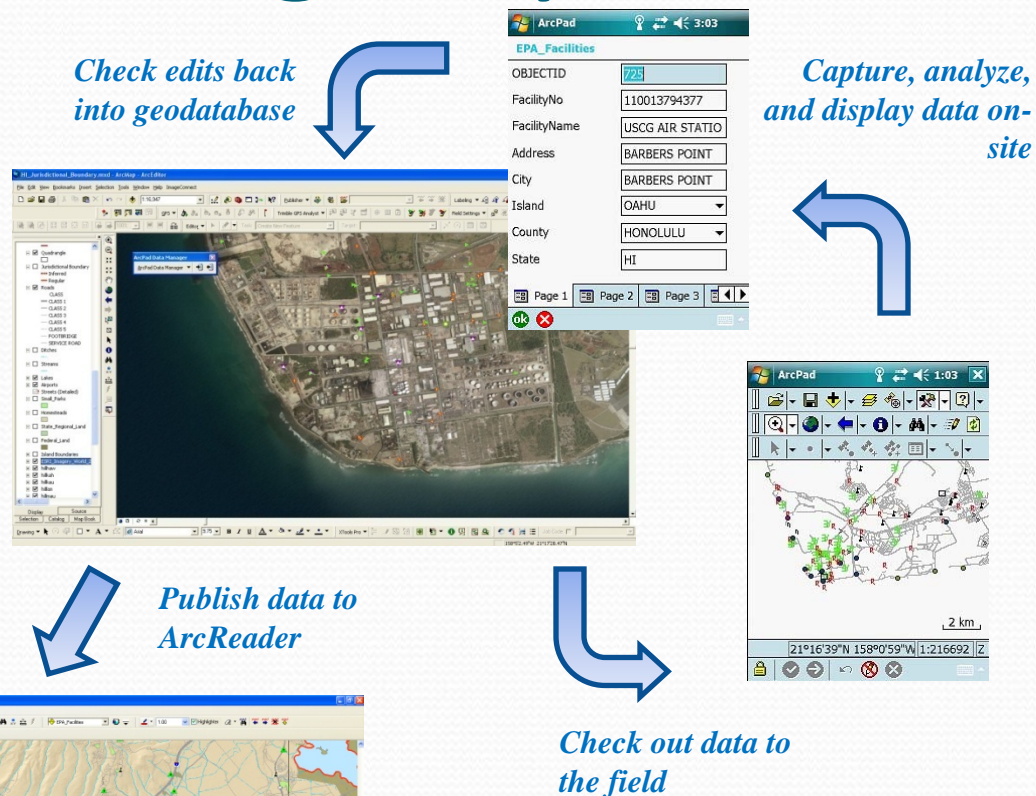
Background

- RRT Inland Area Contingency plans describe information and processes for containing and cleaning up an oil spill or hazmat release that occurs in a defined geographic area. A well-designed contingency plan enables response efforts to proceed smoothly and effectively, minimizes danger to cleanup personnel, reduces the overall costs of cleanup by avoiding unnecessary effort, and ensures that sensitive habitats are protected.
- Understanding the geographic relationships among potential spill and release sources, waterways, access routes, jurisdictional boundaries, population densities and sensitive areas are essential to effective contingency planning at both the area and sub-area levels.



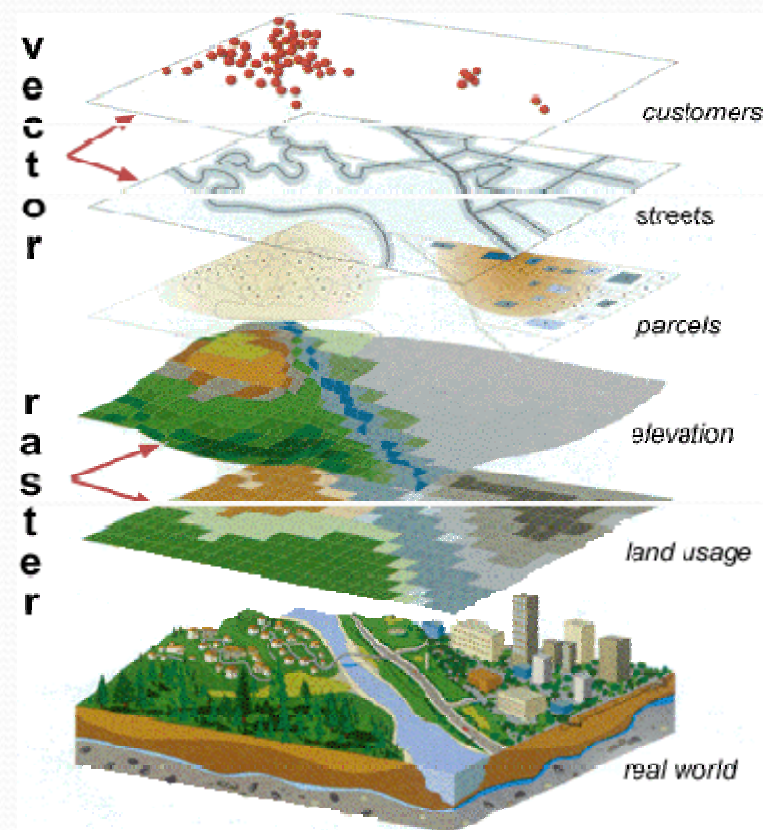
Hawaii Area Contingency Plan

- GPS
 - Collect data
 - Ground-truth data
 - ArcPad
- GIS
 - Geodatabase
 - ArcReader



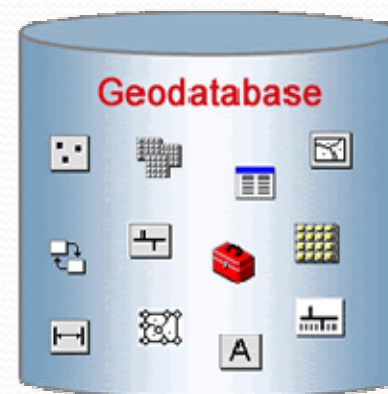
GIS

- GIS allows users to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts.
- A GIS helps answer questions and solve problems by looking at your data in a way that is quickly understood and easily shared.



Geodatabase

- Attribute tables
- Geographic features
- Satellite and aerial imagery
- Surface modeling data
- Survey measurements



ArcCatalog - ArcEditor - C:\Projects\Region 9\Hawaii OHMCP\Database\Hawaii ACP Geodatabase.mdb

File Edit View Go Tools Window Help



Location: C:\Projects\Region 9\Hawaii OHMCP\Database\Hawaii ACP Geodatabase.mdb

Stylesheet: FGDC ESRI

Projects

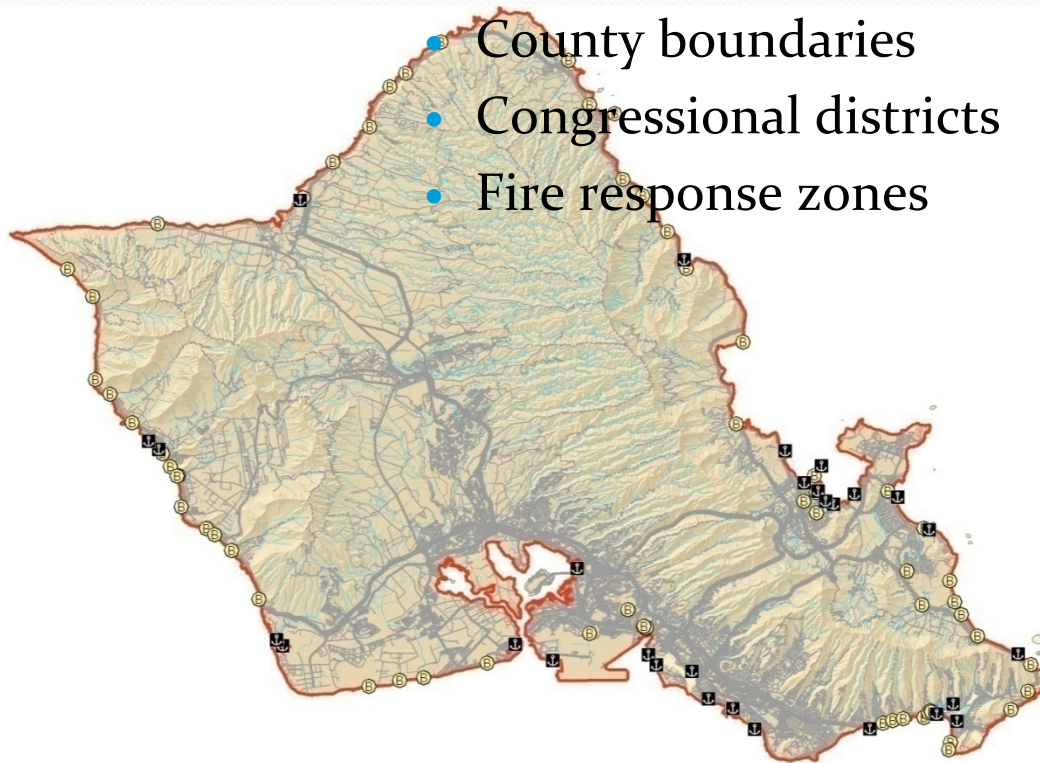
- DRIVERS
- Private
- Region 1
- Region 3
- Region 4
- Region 5
- Region 6
- Region 7
- Region 8
- Region 9
 - Abbott Turkey Run Mine
 - Altoona
 - Hawaii OHMCP
 - CAMEO-ALOHA
 - Database
 - Archives
 - Hawaii ACP Geodatabase.mdb
 - ProgramTable 072407.xls
 - Roads.lyr
 - USCG_Boundary.lyr
 - GIS
 - Aerials
 - ArcPad
 - Data
 - Hillshades

GDBT

Name	GDBT	Contents	Preview	Metadata
County_Boundaries	Personal Geodatabase Feature Class			
Federal_Land	Personal Geodatabase Feature Class			
Homesteads	Personal Geodatabase Feature Class			
Small_Parks	Personal Geodatabase Feature Class			
State_Regional_Land	Personal Geodatabase Feature Class			
Facility_Contacts	Personal Geodatabase Table			
Facility_Programs	Personal Geodatabase Table			
GPS Sessions	GPS Session Folder			
hillhaw	Personal Geodatabase Raster Dataset			
hillkah	Personal Geodatabase Raster Dataset			
hillkau	Personal Geodatabase Raster Dataset			
hilllan	Personal Geodatabase Raster Dataset			
hillmau	Personal Geodatabase Raster Dataset			
hillmol	Personal Geodatabase Raster Dataset			
hillnii	Personal Geodatabase Raster Dataset			
hillloah	Personal Geodatabase Raster Dataset			
USCG_Boundary	Personal Geodatabase Feature Class			
Zip_Codes	Personal Geodatabase Feature Class			

Data Layers

- Base Layers
 - Hydrography
 - Coastline
 - Lakes
 - Streams
 - Ditches
 - Transportation
 - Roads
 - Boat ramps
 - Marinas/harbors
- Boundaries
 - Jurisdictional boundary
 - County boundaries
 - Congressional districts
 - Fire response zones



Data Layers

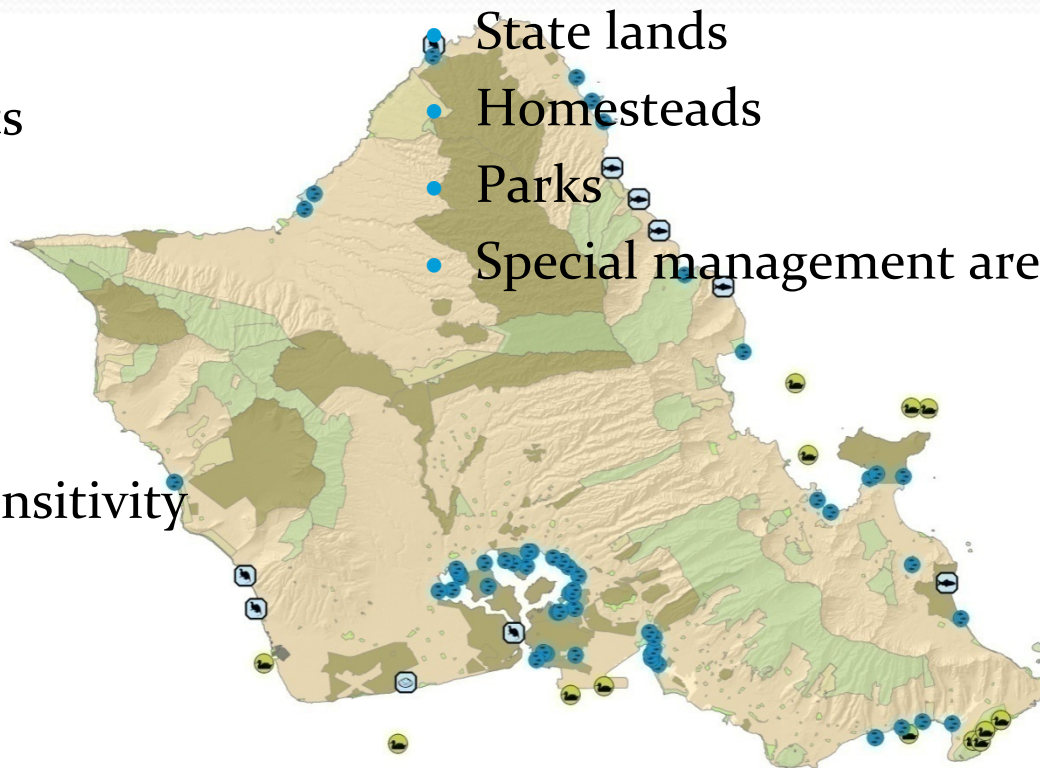
- Sensitive Resources

- Sensitive Species and Natural Communities

- Threatened and endangered plants
 - Wetlands
 - Bird habitats
 - Critical habitats
 - Fishponds
 - Environmental sensitivity index

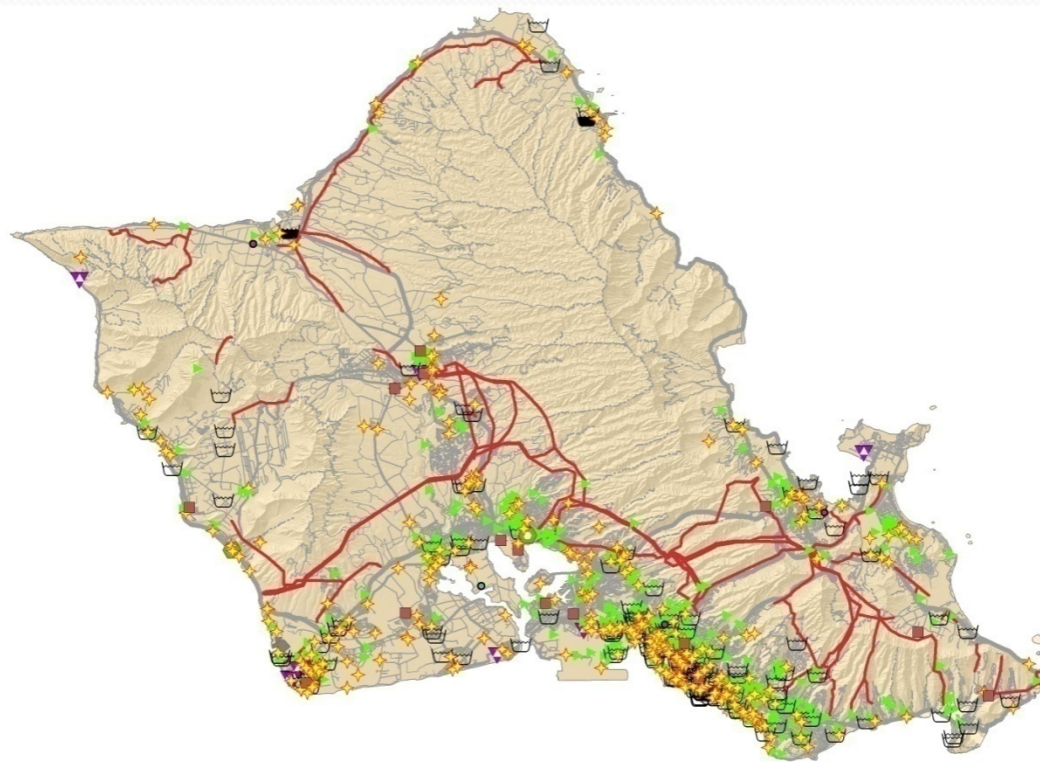
- Managed Areas

- Federal lands
 - State lands
 - Homesteads
 - Parks
 - Special management areas



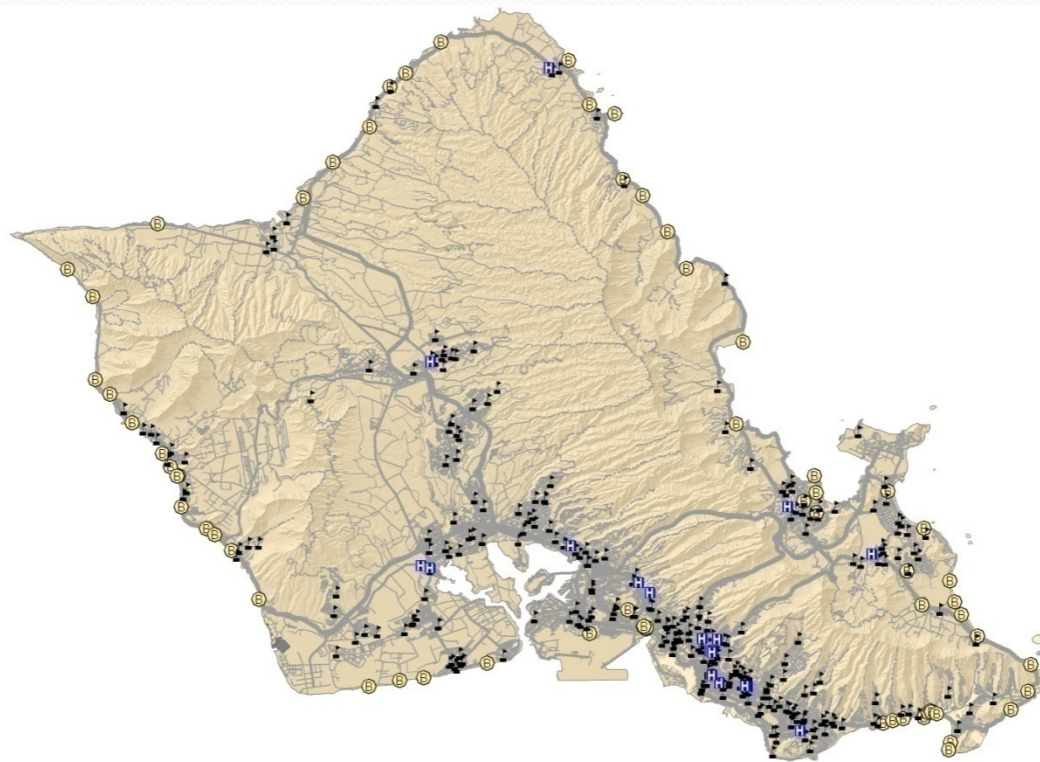
Data Layers

- Potential spill sources
 - Fixed facilities
 - FRP
 - RMP
 - RCRA
 - TRI
 - RCRA
 - WWTP
 - Superfund
 - Tier II
- Pipes and transmission lines

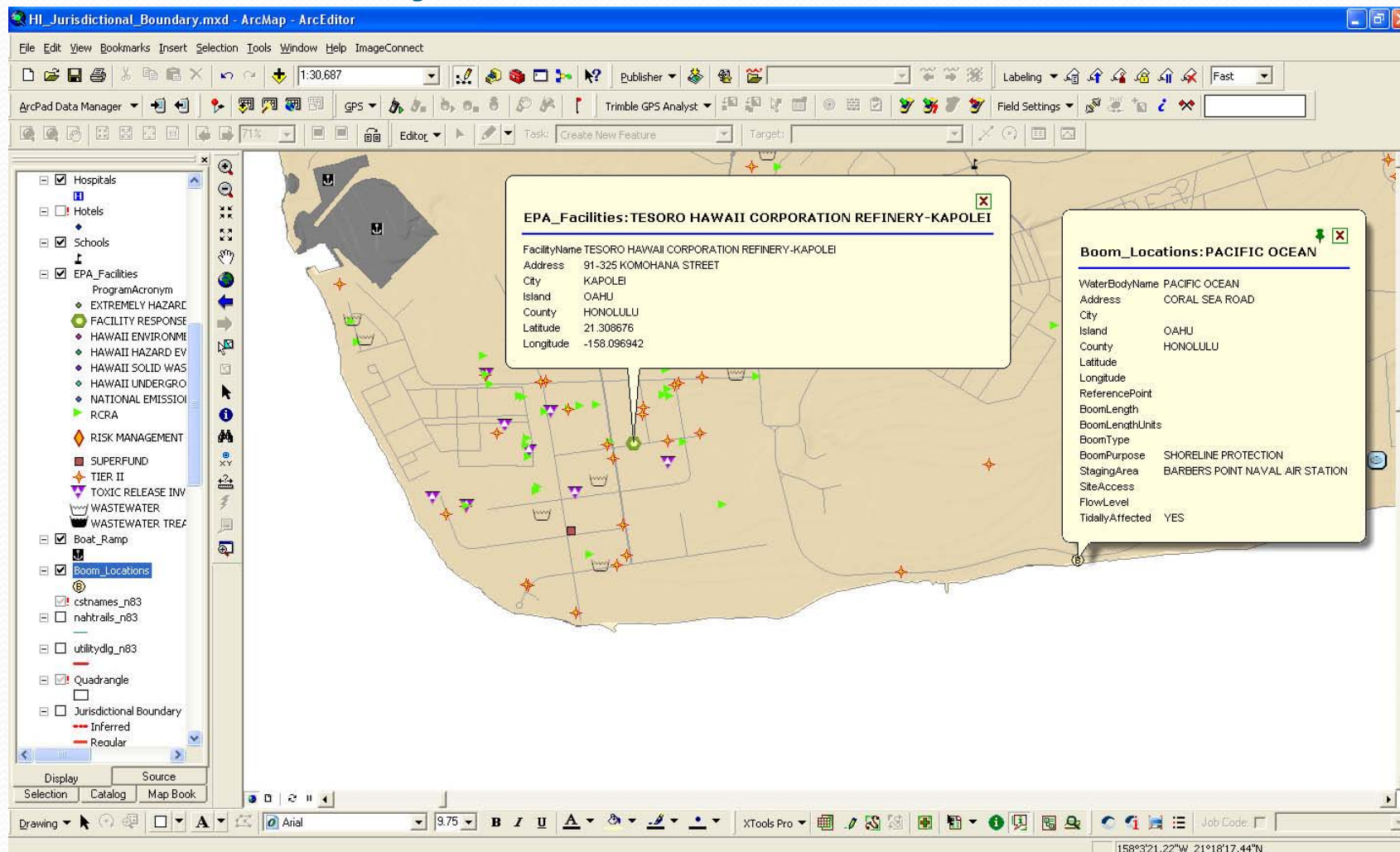


Data Layers

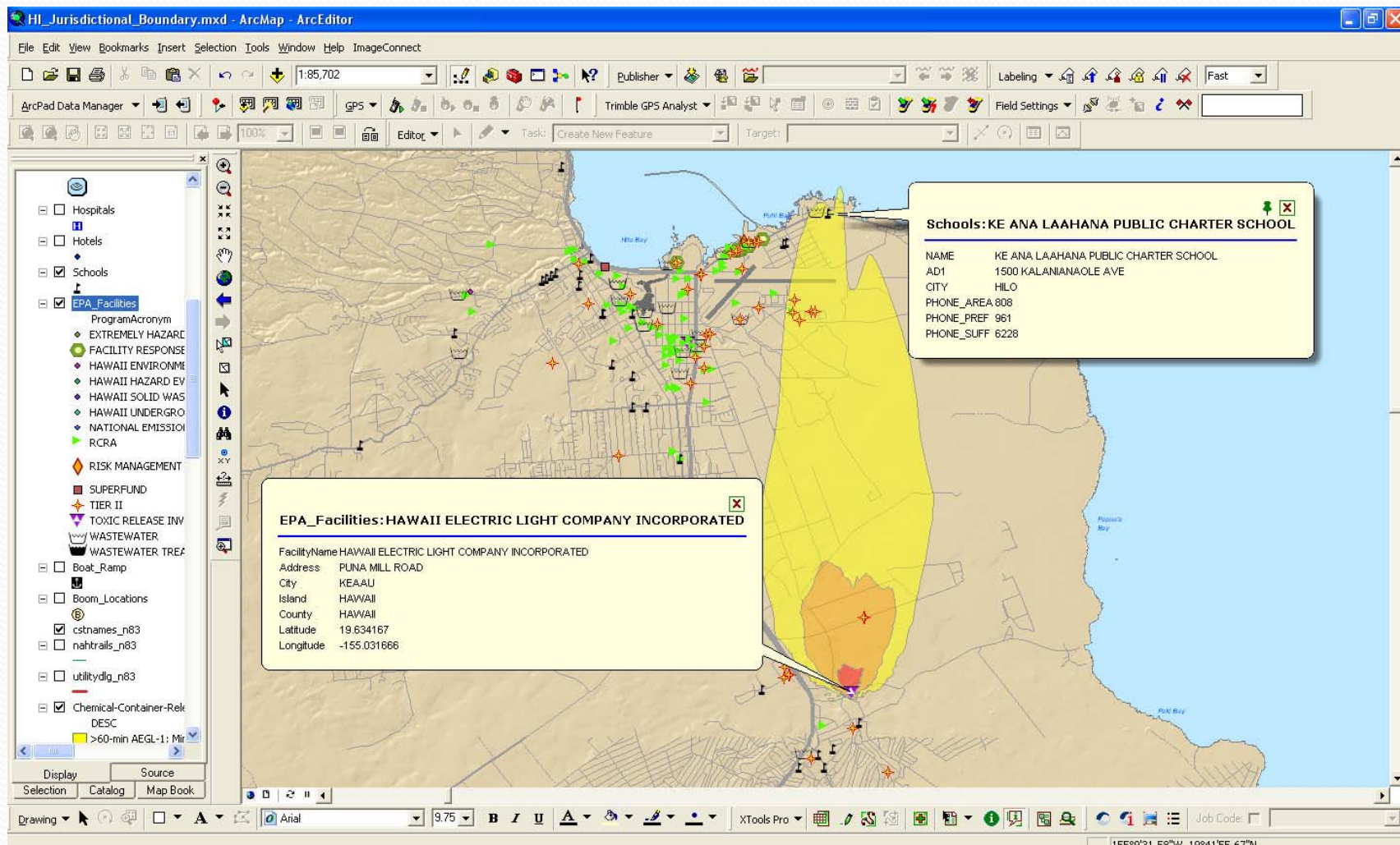
- Miscellaneous data
 - Boom locations
 - Schools
 - Hospitals
 - Land use
 - Parcels
 - Trails



Risk Analysis



Risk Analysis



Data Sources

- EPA Facility Registry System
- U.S. Geological Survey
- NOAA
- U.S. Fish & Wildlife
- HSIP Gold
- State of Hawaii
- City & County of Honolulu
- Honolulu Fire Department



Field Data Collection

- Facilities
- Boom locations
- Boat ramps/marinas
- Jurisdictional boundaries



GPS

- Trimble Nomad
 - High-performance all-in-one integrated
 - 6 GB built-in storage as standard
 - Ultra-rugged form factor
 - Integrated cellular modem option
 - Integrated digital camera and barcode scanner
 - Comes with a range of GIS field software solutions



ArcPad

- Perform reliable, accurate, and validated field data collection.
- Integrate GPS, rangefinders, and digital cameras into GIS data collection.
- Share enterprise data with field-workers for updating and decision making.
- Improve the productivity of GIS data collection.
- Improve the accuracy of the GIS database and make it more up to date.

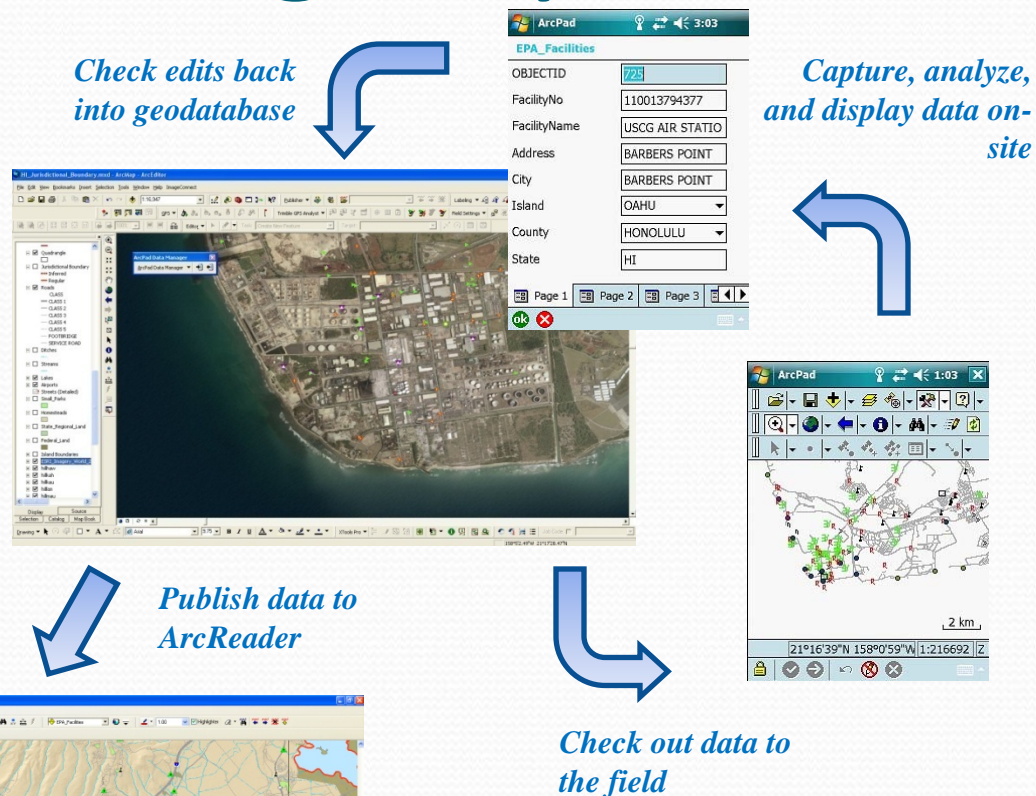


ArcPad



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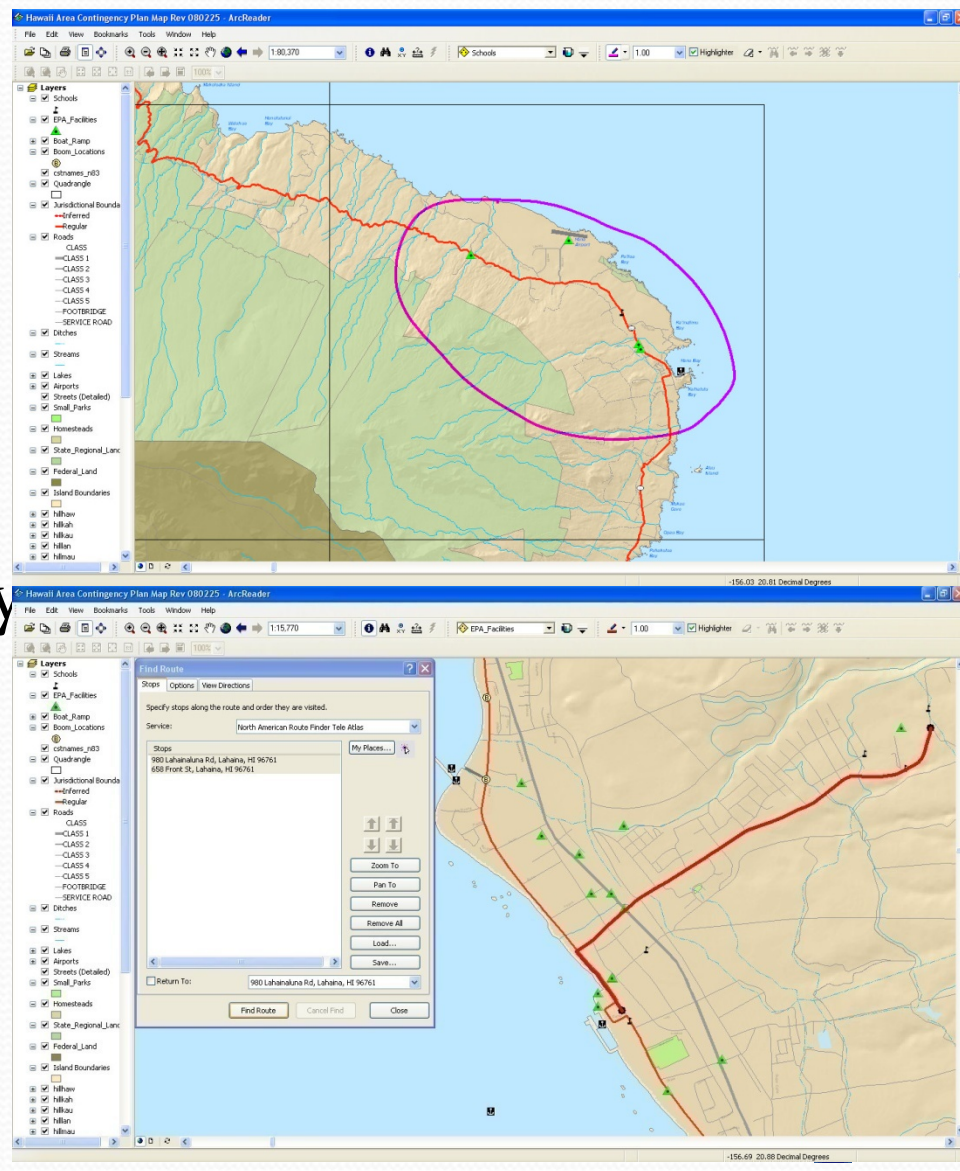
ArcReader

- View, navigate, and print published ArcGIS maps using ArcReader
- Deploy GIS data to novices and professionals alike.
- Zoom, pan, and switch between map and page layout view.
- Communicate more efficiently with the ability to graphically mark up maps.
- Print published map documents including all layer symbology and cartographic map elements on any supported printer.



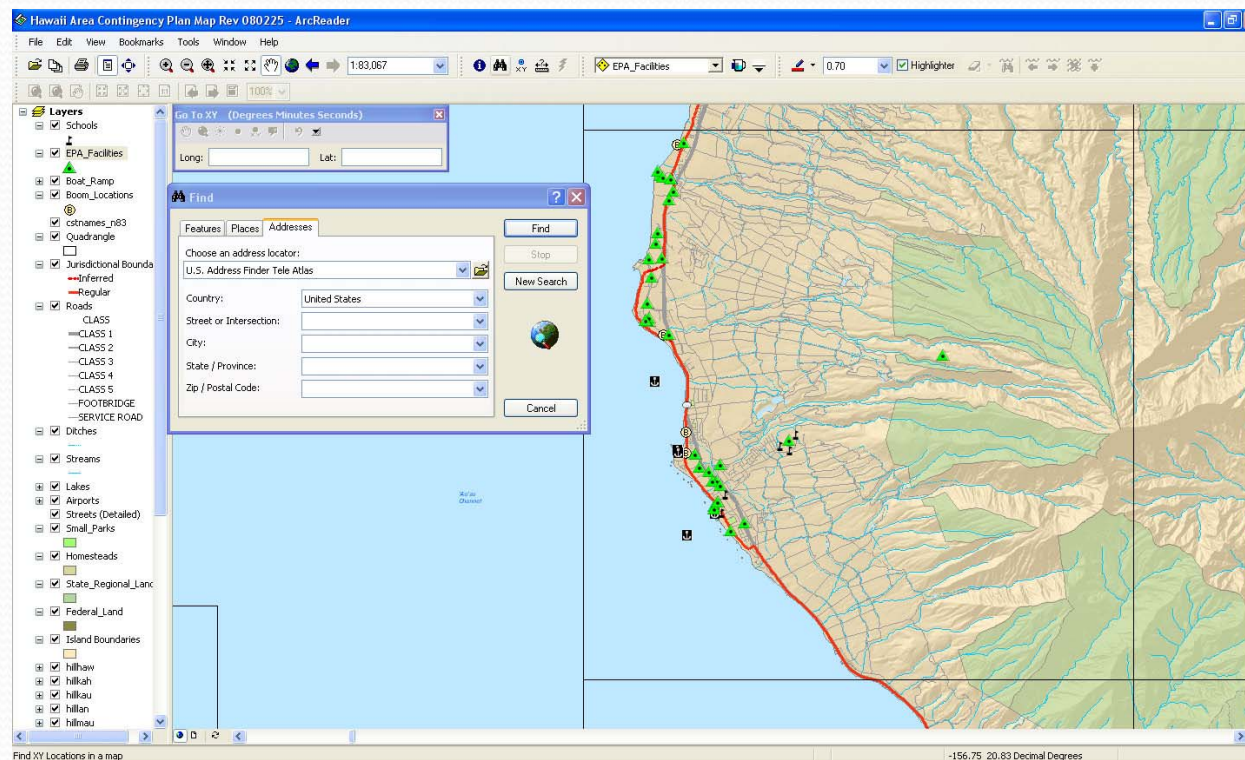
General Tools

- Zoom In
- Zoom Out
- Measure
- Turn layers on and off
- Change layer transparency
- Highlight and markup
- Online services
 - Find route
 - Find nearby places



Search

- Name
- Address
- Coordinates



Find & Identify

HI_Jurisdictional_Boundary.mxd - ArcMap - ArcEditor

File Edit View Bookmarks Insert Selection Tools Window Help ImageConnect

1:300,000

ArcPad Data Manager GPS Trimble GPS Analyst Field Settings

Task: Create New Feature Target:

Find

Features Places Addresses Route Locations

Find: tesoro

In: EPA_Facilities

☒ Find features that are similar to or contain the search string

Search:

☒ All fields

☐ In field:

☐ Each layer's primary display field

Right-click a row to show context menu.

Value

TESORO HAWAII CORPORATION TERMINAL DEPARTME

TESORO HAWAII CORPORATION TERMINAL DEPARTME

TESORO HAWAII CORPORATION

TESORO HAWAII CORPORATION

TESORO HAWAII CORPORATION

TESORO HAWAII CORPORATION REFINERY-KAPOLEI

TESORO HAWAII CORPORATION, TERMINAL DEPARTME

TESORO HAWAII LUNGE AIRPORT TERMINAL

8 objects found

Identify

Identify from: <Top-most layer>

EPA_Facilities

TESORO HAWAII CORPORATION REFINERY-KAPOLEI

Chemical_Inventory

Facility_Programs

Facility_Contacts

Location: -158.096942 21.308676 Decimal Degrees

Field	Value
OBJECTID	1564
FacilityNo	110000486322
FacilityName	TESORO HAWAII CORPORATION REFINERY-KAPOLEI
Address	91-325 KOMOHANA STREET
City	KAPOLEI
Island	OAHU
County	HONOLULU
State	HI
Zip	96707
Latitude	21.308676
Longitude	-158.096942
WaterImpact	<null>
HorizontalCollection	DATABASE
DataSource	Facility Registry System
DateVisited	<null>
Shape	Point
RuleID	<null>
Override	<null>
Updated	<null>
InPrograms	1
Facility_Image	<null>
Photo	<null>

Identified 1 feature

Display Source

Selection Catalog Map Book

Drawing Arial 9.75 XTools Pro Job Code

158°11'56.41"W 21°22'29.68"N

Drill Down

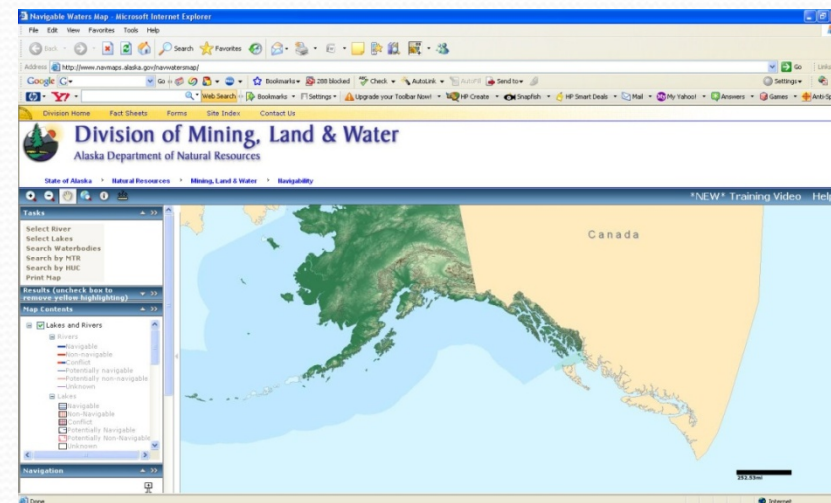
The screenshot displays the ArcMap interface with the 'Identify' window open. The window shows the 'Identify from' dropdown set to '<Top-most layer>'. The 'EPA_Facilities' layer is selected, and the 'BALL METAL BEVERAGE CONTAINER CORPORATION' is identified. The 'Identified 1 feature' section shows the following data:

Field	Value
OBJECTID	495
FACILITY_NO	110000486340
FACILITY_NAME	BALL METAL BEVERAGE CONTAINER CORPORATION
CHEMICAL_NAME	Ink - Polyethylene-polypropylene glycol ethers
CAS	<null>
MAX_STORAGE	<null>
STORAGE_UNITS	<null>
UN_NUMBER	<null>
CHEMINVRECORDID	<null>

The map background shows a geographical area with various symbols (orange diamonds, green triangles, purple triangles) representing different facility types. The bottom status bar indicates the coordinates 158°6'12.87"W 21°17'37.48"N.

Future Work

- Complete jurisdictional boundary
- Ground-truth data
- ArcGIS Server



Contributors

- Janet Yocum, U.S. EPA Region 9
- Greg Powell, U.S. EPA ERT
- Fred Stroud, U.S. EPA ERT
- Dale VonBusch, Tetra Tech

